

CLAIMS

1. A loudspeaker drive unit comprising a visual display screen, a resonant panel-form member positioned adjacent to the display screen and at least a portion of which is transparent and through which the display screen is visible, and vibration exciting means to cause the panel-form member to resonate to act as an acoustic radiator.
2. A loudspeaker drive unit according to claim 1, wherein the whole of the resonant panel-form member is transparent.
3. A loudspeaker drive unit as claimed in claim 1 or claim 2, wherein the resonant panel-form member is of plastics.
4. A loudspeaker drive unit as claimed in any one of claims 1 to 3, wherein the resonant panel-form member is of polystyrene, polycarbonate or glass or a laminate of plastics and glass.
5. A loudspeaker drive unit according to any preceding claim, wherein the panel-form member is a laminate comprising a core of plastics or aerogel with skins of glass.
6. A loudspeaker drive unit according to any preceding claim, comprising more than one vibration exciting means.
7. A loudspeaker drive unit according to any preceding claim, wherein the or each vibration exciting means is mounted to an edge or marginal portion of the panel-form member.
8. A loudspeaker drive unit according to any preceding

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claim, comprising vibration exciters mounted in pairs to an edge or edges or marginal portions of the panel-form member.

9. A loudspeaker drive unit according to any preceding claim, wherein the or each vibration exciting means is coupled directly to the panel-form member.

10. A loudspeaker drive unit according to any preceding claim, wherein the vibration exciting means is electrodynamic.

11. A loudspeaker drive unit according to any preceding claim, wherein the vibration exciting means is inertial.

12. A loudspeaker drive unit according to any preceding claim, comprising associated supporting means in which the drive unit is mounted.

13. A loudspeaker drive unit according to claim 12, wherein the associated supporting means is a frame or chassis.

14. A loudspeaker drive unit according to claim 12 or claim 13, wherein the resonant panel-form member is resiliently supported on the associated supporting means.

15. A loudspeaker drive unit according to any one of claims 12 to 14, wherein the or each vibration exciter is resiliently mounted in the associated supporting means.

16. A loudspeaker drive unit according to any one of claims 12 to 15, wherein the panel-form member is rectangular, and wherein the resilient panel support extends along at least three adjacent edges of the panel-form member.

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17. A loudspeaker drive unit according to any one of claims 1 to 9 or 12 to 16, wherein the vibration exciter comprises a transparent piezoelectric or electret on or in at least a part of the panel-form member.
- 5 18. A loudspeaker drive unit according to any preceding claim, wherein one or more marginal portions of the panel-form member are clamped or restrained.
19. A loudspeaker drive unit according to claim 18, wherein the whole periphery of the panel-form member is
- 10 mechanically clamped.
20. A loudspeaker drive unit according to any preceding claim, wherein panel-form member is mounted in an associated cavity defining means or enclosure enclosing a face of the panel-form member whereby acoustic radiation
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- from the said face is at least partly contained within the enclosure or cavity.
21. A loudspeaker drive unit according to claim 20, wherein the enclosure or cavity is such as to modify the modal behaviour of the panel-form member.
- 20 22. A loudspeaker drive unit according to any preceding claim, wherein the display screen is integral with the panel-form member.
23. A loudspeaker according to claim 22, wherein the integral display screen comprises light emitting or
- 25 transmitting or reflective means.
24. A loudspeaker drive unit according to any preceding claim, wherein the panel-form member forms the external face of a visual display unit or the like.

25. A loudspeaker drive unit according to any preceding claim, comprising a polymer-film liquid crystal display bonded or otherwise mounted on the panel-form member.

26. A loudspeaker drive unit according to any preceding 5 claim, wherein the resonant panel-form member has a user-accessible surface and means on or associated with the surface and responsive to user contact.

27. A loudspeaker drive unit according to claim 26, comprising pads, areas, switches or buttons on the panel- 10 form member and which provide a means for instructions or information to be entered.

28. A loudspeaker drive unit according to claim 26 or 27, comprising visible areas on the panel-form member and delineated by printing or labelling to sense the presence 15 or contact by a user.

29. A loudspeaker drive unit according to any one of claims 26 to 28 comprising metallised user responsive contacts of transparent metal oxide film or thin metal film on the panel-form member.

20 30. A loudspeaker drive unit according to any one of claims 26 to 29, wherein the user responsive means is positioned at the perimeter of the panel-form member.

31. A loudspeaker comprising a loudspeaker drive unit as claimed in any preceding claim.

25 32. A display screen module comprising a loudspeaker drive unit as claimed in any preceding claim, and a chassis or frame supporting the display screen and resiliently supporting the transparent panel-form member.

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34. A portable personal computer comprising a loudspeaker drive unit as claimed in any preceding claim.

5 35. A portable personal computer as claimed in claim 34, comprising a body having a key pad and a lid adapted to enclose the key pad and carrying a display screen, and wherein the display screen comprises a loudspeaker drive unit as claimed in any one of claims 1 to 30. --

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